AMENDMENT TO THE DRAWING(S)

Figs. 2a, 2c, and 3a have been amended, and Figs. 4a and 4b have been replaced. Replacement drawing sheets containing these figures are attached.

REMARKS/ARGUMENT

Regarding the Objection Oath/Declaration:

Attached hereto is a new Declaration in proper form fully executed by all the inventors.

Regarding the Objections Amendments to the Drawings:

With regard to Section 3 of the pending Office Action, claim 43 has been canceled without prejudice.

With regard to Sections 4 and 5 of the Office Action, replacements for Figs. 2a, 2c, and 3a, are submitted herewith. Further in this regard, the Examiner's attention is respectfully directed to the following:

For Fig. 1b, reference numerals 25.11 and 25.12 have been added to page 21, line26 of the specification. The reference numerals A and A1 can be found on the bridging paragraph from page 21 to 22 of the specification as filed. It is therefore, respectfully submitted that no changes to Fig. 1b should be necessary.

With respect to Fig. 2a, the reference numeral A16 has been added to page 24, line 13 of the specification and reference numeral 5.22 has been deleted from Fig. 2a.

With respect to Fig. 2b, reference numerals A_2, $A1_2$, 25.21 and 25.22 have been added to page 24, lines 3, 4 and 6, where the existing text has been corrected as needed. It is therefore respectfully submitted that no changes in Fig. 2b are necessary.

In the substituted Fig. 2c accompanying this response, reference numerals 16, 2.2, 5.22 and 16.22 have been deleted.

With respect of Fig. 3a, reference numeral 20 has been deleted from line 4 of page 25 of the specification, and reference numerals 7.3 and 8.3 have been added to page 25, line 9. Reference numeral 24 has been added to Fig. 3a and an appropriate description has been provided on page 25 of the specification.

With respect to Fig. 3b, reference numeral 18.3 has been corrected on page 25, line 15 of the specification so no changes in Fig. 3b appear to be necessary.

No new matter has been introduced by the foregoing changes.

With regard to Section 6 of the Office Action, replacements for Figs. 4a and 4b are attached.

Regarding the Objections to the Specification:

The errors noted by the Examiner in Section 8 of the Office Action have been corrected. No new matter has been introduced by these corrections.

Regarding the Claims in General:

Claims 1-42 remain pending. Claims 1-11, 16, 17, 20, 21, 28, and 31-34 have been amended to address the Examiner's objections, and the pending rejections, and to otherwise improve the form thereof. As a consequence of the amendments, the claims now recite more explicitly what was already at least implicit (or otherwise highlight previously recited features), and have therefore not been narrowed for statutory purposes related to patentability.

Claims 43-49 have been canceled without prejudice.

Regarding the Objections to the Claims:

Applicants wish to express their appreciation for the Examiner's thorough review of the claims. All of the Examiner's objections have been addressed. In addition, other formal improvements have been made where necessary.

Regarding The Allowable Subject Matter

Applicants note with appreciation the indication that claims 12-15, 17, 38, and 40 would be considered allowable if rewritten to overcome the rejections under 35 U.S.C. 112, and to include all the limitations of their respective parent claims. Because these claims are all directly or indirectly dependent on claim 1 which is believed to be allowable in its present form, claims 12-15, 17, 38, and 40 have been retained in dependent form pending the Examiner's further consideration.

Regarding the Rejection under 35 U.S.C. 112:

Each of the grounds of rejection under 35 U.S.C. 112 have been addressed in the amendments to the claims. With regard to claims 21 and 25, however, the Examiner's attention is respectfully directed to M.P.E.P. § 2173.05(e) which points out that inherent properties or features require no explicit antecedent recitation. A surface, by its very nature, has an "entirety"so reference

to that can not possibly lead to indefiniteness. It is therefore respectfully submitted that the rejection of claims 21 and 25 as indefinite should be withdrawn.

Regarding the Prior Art Rejections:

In the outstanding Office Action, claims 1, 10, 18, 19, 27, 31, 39 and 42 have been rejected as unpatentable over Holko et al. U.S. Patent 3,758,471 (Holko), claims 2, 6-9, 11, 20-26, 37, and 41 have been rejected as being unpatentable over Holko in view of Okabe et al. U.S. Patent 6,037,559 (Okabe), claims 3-5, 11, 16, 28-30, 32-36 and 43 have been rejected as being unpatentable over Holko in view of Metcalfe et al. U.S. Patent 3,644,698 (Metcalfe) and claims 11 and 43 have been rejected as being unpatentable over Holko in view of Pal U.S. Patent 4,689,465 (Pal). It is respectfully submitted that these rejections were not properly applicable to the claims as previously presented, and in any event, are not applicable to the claims as amended. Reconsideration and withdrawal of these rejections are accordingly requested.

Holko, the Examiner's principal reference, discloses a two step welding process (see column 3, lines 15-23 and the corresponding table I). However, Holko fails to disclose a first welding step, which is uniquely limited to diffusion welding by thermal treatment only. Instead, Holko teaches to heat the specimen and also to apply a welding force at the same time by which the diffusion welding is achieved (column 3, lines 12-15). This holds both for step I and II according to table I of Holko.

In comparison to this, the invention teaches first to apply a diffusion welding step, which is achieved by a thermal treatment without any compression forces. This diffusion welding is characterized by the interchange of atoms at the interface of the two parts to be welded without applying a temperature above the melting temperature of the material components and without the application of a mechanical compacting as taught by Holko (see step I, table I).

According to the invention, the mechanical recompacting is applied only after the diffusion welding has been at least partially achieved, said mechanical recompacting step is delayed with respect to the first welding step. Additionally, it is preferably applied at a separate station, which is also spatially distant from the location where the diffusion welding is accomplished. In comparison to this, Holko applies a pressure step at low temperature at first, which is followed by a high temperature step applying a significantly lower pressure.

From the other process conditions according to table II of Holko, it is further clear that Holko does not disclose a first diffusion welding step without any pressure, just by applying a sufficient temperature below the melting temperature as specified in claim 1. Additionally, the argument of the Examiner in bridging paragraph from page 9 to page 10 of the office action is not understood, since Holko does not teach any recompacting after the diffusion welding has been achieved.

Additionally, Holko fails to disclose a first process step without any applied pressure, which leads to an at least partially developed diffusion bond, since said document teaches to apply a certain pressure right from the beginning of the welding process and preferably a high pressure step as a first step of a two step method (see table I of Holko).

In order to even better distinguish these features of the invention from Holko, claim 1 has been amended to specifically recite a first welding step, which leads to a partial diffusion bond by applying sufficient heat without compression, and a second, subsequent welding step, which is temporally delayed with respect to the first welding step and which recompacts the already achieved joint.

Thus, claim 1 as amended now recites a method for producing permanent integral connections of oxide-dispersed metallic materials by welding wherein the method comprises the steps of:

> supplying two materials or components of the materials to be connected to one another; overlapping the materials or components, one over the other, to form an overlapping region, including a joining region at the overlapping region;
>
> performing a first welding operation by heating the materials or components at the joining region below the melting temperatures of the materials or the components without compression, whereby the materials or components form, at least partially, a diffusion bond; and
>
> performing a subsequent and temporally delayed second welding operation by heating the diffusion bond to a temperature below the melting temperature of the materials or components to be connected, and by mechanically recompacting the diffusion bond.

From the discussion above, it should be evident to the Examiner that Holko does not teach a first pressure-free welding step and a second step in which pressure is employed to produce the final weld.

None of the other references remedy the described deficiencies in Holko. Okabe, for example, does not refer to diffusion welding. According to the bridging paragraph in columns 2 and 3, the resistance welding step leads to the melting of a current-supplied portion. Therefore, the conditions of diffusion welding, which requires temperatures below the melting point of the materials to be welded, is not fulfilled. The mechanical recompacting of such a welding joint is not the same as the inventive method which teaches to separate the diffusion welding by applying subsequent and separated steps of first applying a heat treatment (below the melting point) and subsequently applying a mechanical recompacting in combination with a thermal treatment. Usually, both steps are performed at the same time in order to achieve diffusion welding. A combination of Okabe with Holko would also not lead to the inventive concept, since Holko does not teach a first diffusion welding step without the application of mechanical recompacting.

Metcalfe does disclose an apparatus and method for forming continuous solid-state diffusion bonds. However, from the abstract thereof it is obvious that the heated rotatable electrodes both generate the contact and the pressure between the members to be jointed. This is, however, not the inventive separation of the diffusion welding applying a first welding step, achieving at least a partial diffusion bond by temporal treatment, and a subsequent and independent second welding step, which recompacts said diffusion bond mechanically. Also, a combination of Holko and Metcalfe would not lead to the invention.

Finally, Pál also does not disclose a two step process, and, of course, has not been cited as doing so, but only for its disclosure of welding fillers, which applicants do not regard as novel *per se*. In any case, Pál does not disclose, teach or suggest a first pressure-free welding step.

Claims 2-42 are directly or indirectly dependent on claim 1, and accordingly should be allowed for all the reasons stated above. In addition, these claims recite features which, in combination with the features of their respective parent claims are neither taught nor suggested in any of the cited references, either singly or in combination.

In view of the foregoing, favorable reconsideration and allowance of this application are respectfully solicited.

I hereby certify that this correspondence is being transmitted by Facsimile to (571) 273-8300 addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

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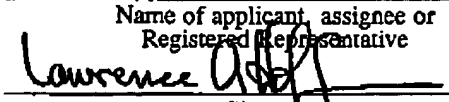
Name of applicant, assignee or Registered Representative



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November 14, 2005
Date of Signature

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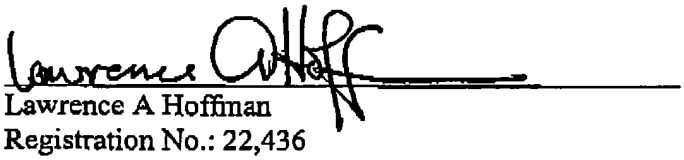
Respectfully submitted,



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